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THE ESTIMATION OF HEART RESERVE*

JULIAN E. GAMMON, M.D.,
Jacksonville.

Gentlemen: I want to discuss briefly the estimation of the heart reserve from a clinical and practical point of view. You know from practical experience that all of you with normal hearts have varying grades of heart reserve, that is, short or long winded, and you also know that after physical training an athlete's heart reserve is increased in accordance with the demands of his sphere of activity.

Exercise tests as a standard for judging heart reserve have not been satisfactory because of the marked variation in heart reserve in normal individuals. The sphere of activity within which the individual lives increases or diminishes heart reserve, as you have seen in the athlete. It is necessary, therefore, to keep in mind the individual's habitual sphere of activity, ascertain whether or not he has any circulatory embarrassment therein, in order to get a fair idea of an individual's response to effort.

You recall, no doubt, that during the war we had thousands of men who had apparently normal hearts as judged from physical examination, X-ray and electrocardiogram, but they were incapable of carrying on the strenuous physical and mental duties of the soldier. These men fell out of ranks with shortness of breath, precordial pain, tachycardia and fatigue under slight to moderate exertion. This condition was variously designated as effort syndrome, neuro-circulatory asthenia, neuro-circulatory myasthenia. The outstanding symptom of effort syndrome is marked fatigibility, not only of the circulatory system but of the neuro-muscular apparatus as well. To one who has examined large numbers of these men it is apparent that they belong to a substandard germ plasm. They can be easily classified into three groups: One, the physically inferior; two, the constitutionally inferior; three, psychoneuroses. Time does not permit further discussion of functional hearts.

Let us go further and investigate the organic heart and its reserve energy. Investigation of these cases usually includes careful history, physical examination and sometimes X-ray or electrocardiographic examination. By these methods we find definite evidence which indicates disease of the organ which necessarily means that the heart is handicapped in some degree, but our problem is to estimate how much the organic heart is handicapped. There are certain factors which I wish to discuss a little more fully which have a bearing on this question:

First, the age of the patient is important since young people repair damage more completely than old people whose hearts are undergoing degenerative processes. These degenerative processes may not be evident on examination.

Second, it is important to ascertain the etiological factor in the pathological process, since we know that certain diseases are progressive, others recurring and some are the fly-by-night type, that is, they cause their damage and disappear without recurrence.

Third, the time element or convalescing period is of importance because it is obvious that we can judge better the reserve of the heart after sufficient time has elapsed between the acute infectious disease and the period of retraining.

Fourth, the character of heart sounds is not of much value in estimating the reserve excepting during the acute illness marked diminution in the well-heard sounds may indicate muscle weakness.

Fifth, heart murmurs are of less importance than was formerly thought. Systolic murmurs require other evidence of disease before they can be given importance. Pressure blowing diastolic murmurs are usually indicative of heart disease.

Sixth, elevated blood pressure, especially high diastolic pressure, causes increased load on the heart and necessarily causes greater wear and tear on the heart muscle. Low blood pressure is not indicative of heart disease in itself; when associated with other evidence of heart disease it may be of importance.

Seventh, enlargement of the heart is always evidence of disease, and that the heart muscle is handicapped. The converse of this is not always true, as a normal size heart does not always mean

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that the heart is normal. Many patients who die of the pain type of heart disease have little or no enlargement.

Eight, clinical disorders of the heart beat, with the exception of sinus arrhythmia, and some types of premature contraction, usually are evidence of serious heart disease.

Even though we have evidence of disease handicapping the heart, the degree of handicap can only be determined by seeing the heart perform within the patient's sphere of activity, and by the patient's ability to increase the heart reserve by retraining.

DISCUSSION.

Dr. M. J. Flipse, Miami:

The subject of cardiac reserve is a most difficult one to talk about because there is very little that can be stated definitely as to its measurement, and in this day of laboratory supremacy we are too apt to refer these cases to the laboratory man for exact measurement.

In regard to cardiac diagnosis: The electrocardiograph, the polygraph, blood pressure measurement, and X-ray have all been tried in an effort to arrive at a positive opinion as to the ability of a certain heart to do its work. In regard to the electrocardiograph, it gives us an accurate measurement of heart rhythm only and we may have a heart which has perfect rhythm but which is very imperfect in function. Blood pressure, as Dr. Gammon has said, does not give us a true idea as to cardiac reserve except in its interpretation with other factors which are present, such as history of the patient, previous diseases and their present activity. However, in regard to the blood pressure we may say this: Interpretation of blood pressure, diastolic and systolic, with careful attention as to the pulse pressure, may give us a very good indication as to cardiac reserve; provided, of course, that the aortic valve be intact. We then should have a relative percentage of diastolic pressure equal to a certain pulse pressure. With decrease in that pulse pressure it is our opinion that the heart muscle is dilated to a certain extent. In the presence of a diminution of pulse pressure with high diastolic, it is apparent that the heart muscle is unable to keep up the systolic pressure and then it gives us an indication as to the condition of the heart muscle.

As far as the polygraph is concerned, the same objections are open there as we cited in regard to the electrocardiograph. It shows rhythm and the relation of the various phases to one another rather than the condition of the heart muscle itself.

Dr. Gammon described heart reserve as functional efficiency. Personally, I cannot quite agree as to the definition. A heart may function perfectly for certain effort, but if the effort is increased it sometimes reaches a point where the heart is no longer able to function correctly, yet that individual may have a good heart reserve as far as his occupation requires.

I think in treating these patients we should first have a talk with them, let them understand that we must treat them over a long period of time if we are to build up their heart reserve. The explanation to the patient of what we can do for heart reserve is very important. A patient will come into your office complaining of some other condition, and you examine his heart and find that he has a low cardiac efficiency. You want to instruct him how to build it up. Concrete exercises and systematized rest constitute a most important regimen in building up heart reserve, and the patient must cooperate in order to get results. Therefore it is necessary to explain to the patient what you want him to do and why.

Regarding heart murmurs: Dr. Gammon stated that presystolic and diastolic murmurs always denoted an organic heart. I do not agree. We may find a diastolic murmur over the sternum in cases of cardiac dilatation, and we may find a typical pre-systolic murmur in the presence of normal heart valves. That was shown during the examination of a large number of army recruits. The functional test that we used put men through a certain amount of exercise and noted the return of the pulse to normal. I believe our present method is the best estimate of cardiac reserve. However, it is not a tape line that you can just measure and say you have so many points of heart reserve or you have so much ability to work. The history is of extreme importance. The occupation of the individual must be considered when we ask him what results he gets when he runs up a flight of steps.

In regard to the size of the heart: The large heart may have a hypertrophy sufficient to take up a condition of increased function and such patients have reserve, or the heart muscle may be weakened and still be enlarged. The acute cardiac dilatation instituted by a supreme effort I believe to be more amenable to treatment than those instituted by repeated effort over a long period of time. You can build up cardiac reserve

more readily in the case that has a dilated heart following a sudden strain.

In regard to the further work on cardiac reserve: You have the patient in bed and want to know when you can let him up. The best way to find out is to see what he does when he gets up. If the heart action increases rapidly and the pulse pressure remains low the indications are against letting him up again for some time. If the heart rate increases ten to fifteen beats to the minute and then comes back to normal when sitting in a chair, that patient should be allowed up at increasing intervals of time. It is better to give the patient too much rest and a prolonged period of recuperation rather than to try to hasten the case.

Dr. Herman Hirsch Harris, Jacksonville:

It has been a pleasure to hear Dr. Gammon's paper on cardiac reserve. I like to hear papers on this subject. After spending about seventeen years in intensive study of cardiac conditions, both in private practice and in some of the large cardiac clinics, I must admit that I do not know any too much about this subject.

There are so many factors which influence this matter of cardiac reserve, it becomes necessary to investigate as many of these factors as possible if we expect our results to approach accuracy. The history is in my opinion the most important factor in the examination, whether we approach the subject from the standpoint of cardiac physiology or cardiac pathology. The work that the patient is capable of performing day by day is after all the best test of cardiac efficiency. If a patient tells me that he is able to climb three or four flights of stairs, without becoming breathless or experiencing cardiac pain or distress, it matters little if I find his heart lacking in this or that, I must conclude that he has a good heart and I usually find by experience that I am right in this opinion.

The problem, however, is not always so easy. I am quite often asked to see a patient who is being prepared for operation. The surgeon has reason to believe that all is not well with his patient's heart. He wishes to determine if his patient is a good risk from a cardiac standpoint. As a rule the problem is not an easy one as no time is allowed for a long or repeated careful examination of the patient's circulatory system. Here again I believe the patient's history, as to previous rheumatic attacks, cardiac failures, breathlessness, palpitation, edema or cardiac pain, to be of first importance. The physical examination should be carefully made, especially with attention to cardiac enlargement and reaction to exercise, if possible, and much should be learned of this patient's myocardium and coronary circulation. Surely we should determine if the patient's heart is contracting in an orderly and efficient manner.

Seventeen or eighteen years ago about all we talked of was aortic or mitral regurgitation and stenosis, and that was about all we learned concerning hearts. But, nowadays, it's about the muscle and measurement of the heart, and how much time is required for each contraction. I think that in estimating cardiac reserve, we have two main factors to consider—what is the condition of this man's heart muscle, and what volume of blood is the heart throwing out into the system every time it contracts. When we purchase an automobile, if there is a forty horsepower engine in the car we are told that it will develop fifty horsepower if you put more gas to it and advance the spark. It is a pity we cannot say that about hearts—that they will develop so many foot pounds of work on a strain. But there is no simple way of measuring the amount of blood thrown into circulation at each cardiac contraction.

There are different exercise tests and some are extremely complicated. The Schneider cardiac efficiency test is quite a lengthy affair. The patient is tested as to pulse rate in prone position, and blood pressure in prone position; and then the blood pressure and pulse rate are taken in a standing position. If the pulse rate increases ten points, score one; and if it increases twenty points, score two. If the blood pressure rises 10 mm. we score him one or two, whatever the chart shows. After exercise, we give the number of increased beats per minute, and score so much for that. After waiting a minute or so for the heart to come back to normal, it is counted at one, two and five minutes, and these are averaged up and we give the patient a total score, for cardiac efficiency.

There are a great many of these tests from which you get a pretty fair idea of what the heart will do. I like this one best: When I have the patient in bed, I take the patient's blood pressure and pulse rate at rest, then ask him simply to raise the body or at least the upper part of the body to a sitting position ten times. I then take the blood pressure and pulse immediately after-

ward and again in one and two minutes. If the heart muscle is not efficient, you will find that the pulse will not slow down in one or one-half minutes, and there will be a delay in the rise of blood pressure. If normal, there will be an almost immediate rise in blood pressure. More blood will be thrown into circulation. But with diminished musculature, the pressure falls, or there is a delay in blood pressure rise.

Dr. Herbert Caldwell, Lake City:

I have been in government work for the past five or six years, and my work has been principally to try to estimate cardiac reserve in the patients who have come to these hospitals. I suppose in that time I have been asked to estimate this reserve at least fifteen thousand times. Perhaps that does not mean so much to us, but it may mean a good deal to the taxpayer when he remembers that the decision may make considerable difference to the treasury. Perhaps, not so much in each case, but when reported often enough it makes a great difference. And when you estimate that this is reported by a number of hospitals all over the country, the difference becomes enormous.

Now, I would like you to understand that when I speak of the patients in the government hospitals, of the Veterans' Bureau especially, I believe that the majority of them are honest. Most of them have either organic or nervous conditions which justify their presence in these hospitals. It remains for the doctors to estimate the amount of their disability, and whether or not this disability is connected with their service. Therefore we have to eliminate the very thing that Dr. Gammon told you to weigh, namely, the patient's own opinion of his heart disability. We are standing between the treasury on the one hand and the patient on the other. And this patient may tell you subconsciously whatever will advance his case. Therefore his opinion is practically worthless. That does not mean that we do not take into consideration his viewpoint. We consider it, but ninety-nine times out of one hundred he will trace the injury to something which occurred between seven and eight years ago, during service, and will give you answers which indicate that he is not able to perform labors that an ordinary individual does. All protest vigorously that they do not want anything from the government which is not theirs by right, but they would like to have that. The history of the case and his opinion of his inability to work are practically worthless. You have to get from that man what you can by making tests. His reaction to position, exercise, etc., is the evidence upon which you are to judge the case.

I have to disagree with Dr. Flipse on what he says about the polygraph and the electrocardiograph. While they are not the final word, they show a great many things beside just the variations of the rhythm. They sometimes show you weaknesses that would be unsuspected without the help of these instruments. I recall one case that we had in the hospital about a month ago with "Observation for myocarditis" on the chart. I put this patient through the regular routine examination of the heart which includes the pulse in three positions: after exertion, and two minutes later; the blood pressure before and after exertion. Apparently he responded to all of these tests well. He had a slight systolic murmur which was unimportant, and I would have said the man was normal, but there were the words, "Observation for myocarditis" on the chart. Perhaps some doctor who had developed a sixth sense—and many of them do—was able to diagnose that myocarditis. I asked for an electrocardiograph on this patient, which was taken on the same day, and showed this (demonstrating on blackboard): The P wave was too far ahead of the Q.R.S.; too long a pause between the auricular and ventricular contractions. The T wave was depressed. The man evidently either had myocarditis or had been taking digitalis. I found out he had been taking digitalis up to about three days previously. Two or three days later another electrocardiograph was taken and instead of showing the same condition, the P wave, his Q.R.S. and his T wave were apparently normal. Every few seconds he registered a long beat nearly twice the length of a normal beat, but the next was of ordinary length. He did not show the evidence of myorcarditis which he had shown on first examination. He did show sin-auricular block, that is, the impulse evidently started, but never even contracted the auricles. After the long pause there was a normal contraction again. All things considered, the patient evidently had a beginning myocardial weakness and a lessened cardiac reserve. I feel like Dr. Harris—after all of the evidence is collected it is difficult to tell the amount of heart reserve. And yet there is hope; the very fact of our willingness to concede the difficulties is a good sign and the work of many earnest men is bound to develop

gradually a surer method for the estimation of the vital point—cardiac reserve.

We should never overlook the fact that the polygraph and the electrocardiograph will show more than just irregularities of rhythm.

CONCLUSION.

Dr. Julian E. Gammon, Jacksonville:

In conclusion I want to point out that the sphere of activity in which an individual lives plays a large part in establishing a normal heart reserve; retraining, as in athletes, increases this reserve. Individuals in all walks of life with normal hearts have varying grades of heart reserve.

The functional heart, or so-called effort syndrome, is in reality not a heart disease. The individual belongs to an inferior germ plasm or sub-strata type. Fatigue, not only of the circulatory system but of the neuro-muscular apparatus, is the outstanding feature of this condition.

We know that organic disease of the heart causes various grades of impairment in its functional efficiency. This impairment can not be measured by physical examination, electrocardiograph and X-ray entirely, but must be measured by the patient's activity in his everyday life, free from symptoms of circulatory embarrassment, and his ability to retrain and increase his sphere of activity and necessarily his heart reserve.

I would like to illustrate this point by stating that I have records of a patient who had been a boiler-maker, served as a private in the engineers corps, completed his training in a training camp in the United States, went overseas, was in the pick and shovel fight at Kimmel Hill in which he was wounded in the leg by a bayonet. He was sent back to the base hospital for treatment and it was found that he had an irregular heart. He was later sent to Lakewood, New Jersey, to General Hospital No. 9, and there we found that he had a moderately enlarged heart with an auricular fibrillation. He stated he had had rheumatic fever a number of years before, that his family physician found his heart irregular five years previous to admission to the hospital. We found on electrocardiographic examination that he had auricular fibrillation. He had experienced no especial discomfort from his heart during his service or during the time that he was a boiler-maker.

I recall another man who had an enlarged heart with complete heart block, pulse 35 to the minute, and the electrocardiographic tracing showed that he had a complete heart block and auricular fibrillation. This young man had experienced no heart embarrassment whatsoever, and took pride in demonstrating his athletic ability. I could cite numbers of other patients to substantiate this point, but time does not permit.

SOME PRE-OPERATIVE FACTORS INFLUENCING THE MORTALITY OF PROSTATECTOMY*

JOHN E. HALL, M.D.,
West Palm Beach.

Symptomatic treatment of prostatic hypertrophy by the general practitioner is directly responsible for the high mortality of prostatectomy, and as a result of such treatment, thousands of old men afflicted with this disease die annually. This is a harsh but, nevertheless, true accusation, since he is the one to whom the prostatic first applies for relief in the initial stages of his disease, and if, at this time, he told the patient that surgical treatment was the only form offering him any hope of permanent relief, and advised that such treatment should not be deferred, many would live who otherwise die.

The general practitioner comes in contact with this disease more frequently than he does any other, in which surgery is so obviously indicated, yet in no other is he so prone to institute palliative treatment, regardless of symptoms. The reason for the institution of such treatment can not be attributed to lack of understanding on the physician's part as to the nature of the condition, for the subjective symptoms, together with the patient's age, render the diagnosis obvious.

Can he explain his attitude in the treatment of these patients? Is it because he thinks such treatment is really indicated, and is not aware that he is dealing with a mechanical obstruction which is amenable to surgical removal only, and that statistics show twenty per cent of all such cases degenerate into malignancy? No, the general practitioner is essentially well informed, and is fully cognizant of the underlying cause bringing about the subjective symptoms. His reluctance in advising surgical treatment may be ascribed to the fact that he recalls, without having to go far back into the past, that the mortality following this operation was so great it was universally thought arrangements should be made with an undertaker to conduct the coming

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funeral, before the operation was performed.

In order to overcome this tendency toward operative procrastination on the part of the general practitioner, it is necessary to convince him that the following statements are true: First, that prostatectomy before the advent of kidney functional tests and blood chemistry determinations, and prostatectomy at the present time, are entirely different procedures, with an altogether different operative outcome. Second, that this operation is no more to be dreaded than an appendectomy, performed upon a patient of similar age, if done before serious secondary changes have taken place in the renal and cardiovascular systems.

He should be impressed with the fact that the constant presence of a residual urine, around two and one-half to three ounces, is sufficient to justify one in advising a prostatectomy. This amount is enough to cause more or less back-pressure on the kidneys, and it gradually increases as the gland enlarges, resulting in destruction of these organs by such back-pressure and infection. Self catheterization by the patient for relief of the residual urine should never be encouraged by the physician, on account of the possibility of resultant infection following its use. Watson compiled the outcome in 207 cases of prostatic obstruction, in which self catheterization was instituted. He states from these figures, that during the first month following institution of catheterization, the mortality was eight per cent, and in the first two months it was ten per cent. This form of treatment offers no hope of saving the patient from ultimate operation, which has to be performed under less favorable conditions than those existing before the initial catheter treatment.

Halle and Albarran denounce the use of the catheter as a palliative measure on the grounds that many cases of prostatic hypertrophy have a tendency to become malignant, and contend that since this is true, no treatment other than operative is justifiable in this condition. There is another reason why prostatectomy is looked at askance by both the laity and physicians. It is generally thought that prostatectomy not only destroys sexual function but also desire. This belief militates against early operation, as few men ever reach the age where they are willing to renounce all hope of sexual potency.

Is it true that prostatectomy produces this result? Let us see what the urologists have to say. At the meeting of the International Urological Congress in 1920, the consensus of opinion was, that following a properly performed supra-pubic prostatectomy, the genital function was not endangered, but to the contrary, many of them have an increase in sexual power following this operation.

That injury does not result is explained by Blum of Vienna, thus: "There is no such thing as prostatic hypertrophy, the real truth being that it is a neoplastic disease, or the formation of an adenoma of the submucous glands of the prostatic urethra, within the prostate. The prostate is shoved aside by the encroaching adenomatous growth, and is converted into a capsule, consisting of atrophic prostatic tissue, poor in glandular substance and surrounding the adenoma. This capsule, which is really only the atrophied prostate, contains the ejaculatory ducts, shoved aside and occluded by the surrounding pressure." He further states that following a correctly performed supra-pubic enucleation, there is no destruction of the seminal ducts, and instead of rendering the patient impotent, there is a rejuvenation after enucleation, due to the fact that following removal of the adenoma, a regeneration of the compressed and atrophied prostate takes place. As a result, it follows that the normal function, both excretory and incretory, is resumed.

Zuckerkandl and Cuthbert Wallace agree with Blum that the operation exerts no influence on the sexual powers, other than to cause an increase in sexual desire and potency, as health and strength are regained. Zukerkandl further states that a number of his patients had ejaculations after prostatectomy, and one of them had living spermatozoa in the ejaculated fluid.

Since the urologist is rarely referred any but the far advanced prostatic patient for operative treatment, it is not amiss to describe the typical one as he appears at this time. One sees an apathetic old man, morose and despondent, whose muscles have atrophied and withered away. His eyes are dull and vacant, with wrinkled pouches beneath them. His skin has a death-like cast, and is cold and clammy to touch. His arteries are hardened and distended. His breath has a characteristic urinary odor, and the tongue is dry, furred and thickened. His bladder is overdistended, and not infrequently he has an overflow dribbling. One realizes at a glance that he is dealing with an old worn-out human wreck, sick, weakened and poorly nourished from lack of food assimilation, exhausted by loss of sleep,

due to getting up at short intervals throughout the night to urinate; toxic, on account of blood absorption of poisonous retained products, and uroseptic, as a result of impairment of renal function.

As an operative risk, such a man is almost a negligible quantity. However, it is expected of us to operate and functionally restore him. It is to our credit that we take these worn-out old men and successfully operate upon them. By doing so, we not only relieve them of their constant suffering but give them comfort and add quite a few years to their lives.

Taking a patient as described, and getting him into condition to undergo this severe operation, with a reasonable degree of safety as to the operative outcome, entails much time and close observation on the urologist's part. Preoperative treatment may have to be continued for many weeks, or even months, in order to bring about such a result. Naturally, the first step is to empty the distended bladder and relieve the kidneys of the back-pressure exerted upon them. This in itself is a simple matter, but sometimes dire consequences follow when emptied too rapidly by catheterization, as one or both of two things may happen. The first is that severe hemorrhage may take place and immense clots form in the bladder. These clots can only be removed by cystotomy. Such hemorrhage is caused by the rapid release of the intra-vesical pressure on the distended veins of the bladder walls. The second is acute congestion of the kidneys with complete suppression of urine, in which case death may ensue. These two things happened to a patient of mine several years ago, since which time I have been exceedingly cautious in dealing with distended bladders. This applies following cystotomy in such cases. The rapid release of intra-renal pressure is followed by great dilatation of the renal blood vessels, and suppression of urine. For these reasons, the emptying of a distended bladder should extend over a period of time sufficient for the readjustment of the renal and cardio-vascular systems to the diminished pressure.

The next step following bladder decompression is to bring about both mental and physical reaction from the uremic or uroseptic state. The majority of advanced prostatic patients are listless, taking little or no interest in anything, and utterly hopeless as to their outcome. The prime essential in treating such patients is to inspire them with confidence in one's ability to render them assistance. It is necessary to constantly reassure them that they are improving and, following operation, will be restored to health. Unless one is able to overcome their fears and doubts, little can be done toward bringing about a physical reaction.

Water must be given them in large quantities to aid the excretory organs in throwing off the retained poisons. Many of these patients are unable to drink much water on account of distaste and nausea, and one is forced to administer fluids by proctoclysis, or hypodermoclysis. Normal salt solution may be used, but a five per cent solution of bicarbonate of soda is preferable, since it increases the alkaline reserve of the body and lessens the liability of acidosis. Nearly all of these old men are constipated, due to leading sedentary lives and, too, because the enlarged gland mechanically obstructs the normal passage in the rectum. Close attention, therefore, should be paid to keeping the intestinal tract flushed out with salines, as this greatly assists in the elimination of toxins.

Much discussion has taken place as to whether the bladder should be drained by the indwelling catheter, or the supra-pubic tube. Personally, drainage by means of the retained catheter is preferred, as this eliminates having to deal with scar-tissue around the supra-pubic wound at the time of enucleation of the prostate. However, in my hands, the catheter has not given satisfactory drainage for any considerable length of time. It not only has a frequent tendency to become occluded but also to slip out of the bladder into the urethra, regardless of how much adhesive tape is used to anchor it. Another objection to its use is that urethritis almost invariably develops within a few days following anchorage, with epididymitis as a subsequent result in quite a few cases. It is easily explained why epididymitis should follow the placing of the permanent catheter, when one recalls the anatomy of the urethra. The catheter mechanically irritates the entire urethra, causing inflammation, followed by infection. This infection involves the entire canal, and as the ejaculatory ducts open upon, or within the margins of the prostatic sinus, it is conveyed upward through them to the seminal vesicles and along the vasa to the epididymes.

As previously stated, about twenty per cent of all cases of prostatic obstruction are found to be malignant, and as the application of radium is indicated at the time of operation (conceding that such a gland should be enucleated), it is

imperative to ascertain, prior to operation, the presence or absence of this condition. Cystoscopy is valuable in determining this. Malignancy presents a picture of ulcerative areas, with hemorrhagic tendencies, nodular elevations and evidences of infiltrations, particularly if degenerative changes have taken place. However, many cases do not show mucosal involvement until in the latter stages of the disease. Cystoscopy should be employed as a routine in the examination of prostatic obstruction cases, if force does not have to be exerted in introducing the instrument, and the patient's general condition is good. There are quite a few cases in which the urethra is distorted and elongated as a result of the glandular hyperplasia, and this interferes with the passage of the cystoscope. However, the information gained from an intra-vesical picture fully justifies the bladder disturbance incident to the passage of the instrument.

The information furnished by the phthalein test and blood chemistry examination is of paramount importance in determining the renal function. The phthalein test indicates the excretory power of the kidney, while blood chemistry tells us the exact amount of waste products retained in the blood, which under normal conditions are eliminated.

Olmsted and Caulk claim there is a fairly constant relation between the excretion of phthalein and retained blood nitrogen, and they have seen no cases of nitrogen retention which showed normal phthalein excretion. They further state it is exceedingly rare to see nitrogen retention, unless the phthalein excretion is forty per cent or less, in two hours, and this is true in any type of low kidney function.

Columbet (Journal d' Urologie) claims the phthalein test is a better operative index than blood urea determination, stating that urea retention in the blood is in direct relation to alimentation, except when there are very advanced renal lesions, since the amount of blood urea may almost always be reduced to a safe operative point by proper regulation of diet. He believes an output of forty-five per cent phthalein in the first two hours, following intravenous injection, is sufficient indication for safe operative risk, and that this test is superior to all others, from the standpoint of prognosis in prostatectomy. Bransford Lewis, of St. Louis, on the other hand, believes the hemoglobin percentage is of greater value than the phthalein test as a factor in prognosis. He asserts a hemoglobin percentage of sixty per cent indicates a favorable outcome, fifty per cent is questionable, forty per cent unfavorable, and thirty per cent fatal following operation.

It should not be forgotten that the quantity as well as the specific gravity of the urine are important factors, as an increased output of persistently low specific gravity indicates the presence of a low grade interstitial nephritis.

Another preoperative, as well as postoperative factor influencing the prognosis, is the nursing of these patients. The average nurse knows nothing and cares less about nursing prostatic patients, and if she undertakes the care of such a case, it is because work is slack with her at the time. One doing this special line of operative work should have specially trained nurses to take care of his patients, or else he will lose many whom he should not lose. Such nurses should have cheerful dispositions, as well as tact and sympathy, as these qualities are essential in the management of old men who are, as a rule, babyish and exceedingly obstinate.

In closing, I desire to state there are other preoperative factors of importance, but time prevents taking them up in detail.

DISCUSSION.

Dr. E. S. Gilmer, Tampa:

I have enjoyed hearing Dr. Hall's paper on a subject that is of importance to both the general practitioner and the specialist. Prognosis is the most important phase of conditions of this kind. There are three systems in the human body that influence mainly the prognosis of prostatectomy, namely, respiratory system, urinary system and cardio-vascular system. Respiratory system is not as important now as formerly since we have begun the use of local and regional anesthesia. The urinary system is of considerable importance, although some of us will pay too much attention to this to the exclusion of the cardio-vascular system. In the urinary system we determine generally the condition of the kidneys by determination of renal function and by the blood chemistry. I think in the blood chemistry the amount of nitrogenous retention is not of so much importance as its stability, that is, its consistency. We can have considerable over the normal amount of nitrogenous retention, but if it is consistent we can safely do a prostatectomy in a great many cases. Kretschmer reports a case where the patient had as much as 9 mg. of creatinin to 100 c.c. of blood, but it was con-

sistent and his general condition was good. He operated and carried the patient through to a complete recovery. The condition of the cardiovascular system also greatly influences the prognosis of prostatectomy. I do not think we should ever operate on a patient with a very high or a very low blood pressure. In every case before we operate the aid of a competent internist should be employed to determine the patient's general condition, particularly as regards to the cardiovascular system.

Another factor influencing prognosis of the operations is the anesthetic. Before we began the use of local and regional anesthesia, we had a great many more deaths than we do now, due directly to a general anesthetic. Personally I like the sacral or caudal anesthesia. Have used spinal anesthesia several times, but have been frightened by it once or twice and am afraid to use it.

The mental attitude of your patient has much to do with his recovery. If the patient goes under operation depressed and with the impression that he is going to die, his chances are not nearly as good and he should be kept under observation until he is in a better frame of mind.

As to the preparation of the patient, whether the operation is done in one or two stages, I do not think this particularly influences the outcome of the ordinary case. To do a one-stage operation you must do your preliminary drainage by means of a retention catheter. In some cases you cannot pass a catheter through the urethra into the bladder and in others there is an intolerance to the presence of the catheter in the urethra, when you have to do a supra-pubic cystotomy which is more or less dangerous in cases of large amounts of residual urine.

As far as sexual results are concerned I believe that a prostatectomy should not necessarily incompacitate a patient. I recall two cases I operated on recently who state that they are better sexually now than before operation.

Before closing I wish to emphasize one point that Dr. Hall brought out, and that is about catheterizing and completely draining the bladder of those old men who have an acute retention of greater or less amounts of residual urine. This is a dangerous procedure and will often induce uremia and bring about the death of the patient.

Dr. Robt. McIver, Jacksonville:

The comprehensive paper on this subject and the full discussion that Dr. Gilmer has made, developed the salient points. I will indicate some data from the preoperative study of a consecutive series. Emphasis was made that these cases require, and it is necessary to give them, a most thorough examination, because we are dealing with individuals in the declining years of life, the majority being found in the decade between sixty-five and seventy-five.

Prostatics require team work more than any class of patients in need of surgical attention. By close cooperation between the surgeon, who should be a competent cystoscopist, the internist and the clinical laboratory, a material gain is assured.

In our series the additional diagnoses preponderate in the cardiovascular system. The arteriosclerotic group and the cardiac lesion group constituted about one-third of the additional diagnoses found; secondly, the pulmonary system, bronchiecstasis and bronchitis; and thirdly, nephritis and hypertension. One case of appendicitis developed acute retention and had to have the prostate out before he was able to leave the hospital.

Cystoscopy determines the presence or absence of foreign bodies, stones, tumors and diverticulæ. A large diverticula may contain stone, and here a cystogram gives definite data. It is well to rule out the possibility of tumor. Recently a case was sent in for hematuria. It developed that he had an enlarged prostate and the hematuria was attributed to engorgement of the veins of the vesicle neck. Cystoscopy showed a bleeding papilloma on the left wall of the bladder, so that there were two surgical conditions present. Cystoscopy also aids in selecting the type of operation to be performed.

In our series the majority were between sixty-five and seventy-five years. The oldest in the series was ninety, and there were several above eighty. The older patients seem to do almost as well, but their preparation usually requires a longer time.

The principal symptoms in this series were frequency, disuria and retention. The residual urine varied from 60 c.c. to 1600 c.c., with an average of 240 c.c. Preliminary treatment was entirely after supropubic drainage.

Before treatment, the best phthalein was 60%, the lowest 10%, and after preliminary treatment the best phthalein was 80%, the lowest 50%. In other words, before drainage the average case presented phthalein 38%, and after cystostomy, 65%. Blood urea: greatest retention 61 mg.

per 100 c.c. of whole oxalated blood, the lowest 20; averaging 35 mg. before and 18 mg. after treatment. Creatinine: the highest retention 7.1 mg. and the lowest 1.8 mg., averaging before 2½ mg. and after treatment 1 mg. The output of urine, another important point, on admission averaged 1200 c.c. in twenty-four hours, and after preliminary treatment, 2800 c.c.

Of the cases handled, 28 were general hypertrophy, 8 fibrosis, and 4 median bar. Suprapubic two-stage operation 36, and the cautery punch operation 4.

Of the forty cases there was no case of postoperative incontinence, and no case of postoperative fistula. There was one case of postoperative dysuria and one case of prolonged dribbling.

Before closing I would like to emphasize the importance of doing this work without the use of a general anesthetic. The choice of local infiltration, combined caudal and transacral block, or spinal anesthesia should rest with the surgeon. Caudal anesthesia combined with the sacral block gives satisfactory anesthesia in the big majority of cases. Of forty cases all done under transacral block with caudal injection, a general anesthetic was given to only one case. The anesthesia was poor in two, fair in two and satisfactory in thirty-five.

Dr. W. W. Kirk, Jacksonville:

This morning there was some very interesting discussion of heart reserve preliminary to operation. Granting that the prostatectomy case that is coming up for operation and the respiratory apparatus is in good condition and the heart is in as good condition as can be expected, still with the patients that average from sixty-five to seventy-five years of age, I think the surgeons will admit that they have a potentially serious risk.

I am going to take the liberty of first discussing this element of the blood nitrogen question in relation to the selection of the time of operation in this type of cases. We grant that the patient has had an adequate amount of urinalysis work and a sufficient study of the phthalein elimination. The normal blood urea nitrogen to the 100 c.c. of oxalated blood is 12 to 15 mm. of nitrogen, and it is quite constant on the average diet to which the patient is accustomed. Your prostatic case has probably been on a nephritic diet for some time in a number of instances, but a non-complicated case will probably not show much more than an average of 18 in simple hypertrophy. They show this average of 18 to 20 quite routinely in the absence of complications of note. These cases can be operated on provided the preparation mentioned previously has been done with a reasonable degree of success. On the other hand, there must be caution exercised when there is an average of from 20 to 25. It is safer to reduce them to a lower level, which can be done in the method which the doctor has outlined. Cases, on the other hand, which show a 25 plus or from 25 to 50 should not be operated on without every possible precaution.

The nitrogen determination can be made in one-half hour, and at very little additional expense to the patient, and I feel personally that every precaution should be taken in these cases regardless of what we might know about them, as the age factor alone makes them a potentially serious surgical undertaking.

Dr. Edmund H. Teeter, Jacksonville:

There is just one point that I would like to add. When in Philadelphia last October I saw Deaver, who was doing quite a number of prostatectomies. The mortality, he stated, in suprapubic prostatectomies was about twelve per cent in a certain hospital, which was entirely too high. In Baltimore, Young, using the perineal route, reports his mortality as low as three and one-half per cent.

In the latter operation there is one great advantage over the suprapubic prostatectomy, and that is your operative field is always exposed and you can definitely control all hemorrhage. Therefore, I feel that the perineal prostatectomy is the route to be chosen in the majority of cases.

Dr. C. D. Christ, Orlando:

Perineal prostatectomy as compared with suprapubic prostatectomy in the hands of the average general surgeon is not very good. Young has acknowledged that every man who has seen him work concedes that. There are a great many more dangers in the perineal prostatectomy and I rather doubt that the hemorrhage is so easily stopped, in that way. In the suprapubic prostatectomy where you can fully expose the bladder with the triple tractor, and where you can go down and suture the two edges together and absolutely stop all bleeding, it is by far the most satisfactory thing in the hands of the general surgeon. Now, in the results, some of the most favorable die on you, and some of the worst of the worst will get well. The clinical laboratory

findings are certainly most excellent and they are a guide where a man has that facility, and every man who is doing that work today should have at least the major portion of these facilities at his command.

After all is said and done about selecting your cases, when a case comes in to you with acute retention you must do something for him. You attempt to catheterize him but cannot do it. You can't get a soft rubber catheter in, nor a metal catheter by. You must give him relief, and the next thing to do is a preliminary suprapubic drainage. I do think that where the bladder is infected a two-stage operation should be resorted to. However, I do think that too many two-stage operations are done. In a lot of these cases with a limited degree of infection in the bladder, a one-stage operation can be done, the hemorrhage can be stopped and it saves the patient a great deal of time and a great deal of trouble, and I believe it lessens your mortality in lots of cases.

CONCLUSION.

Dr. John E. Hall, West Palm Beach:

I have nothing further to say, except that I desire to thank the gentlemen for their liberal discussion of my paper.

I refrained from taking up the perineal and suprapubic methods of operation, as that usually brings about an interminable discussion as to the relative advantages and disadvantages of each separate method.

It was stated by one of the gentlemen in his discussion of my paper that hemorrhage was more likely to follow the suprapubic method than it was the perineal. I beg to differ with him on that point. Following cystotomy, there is a shrinkage of the distended veins of the bladder walls and also of those of the capsule of the prostate, and after constant drainage by this method, the vascularity is diminished to a great extent, thereby lessening the danger of hemorrhage at the time of the second stage, or the enucleation of the gland.

As to the length of time that these patients should be drained before doing the second stage, this varies with the individual patient. I have allowed them to drain as long as eleven months, in one case, before the nitrogen was reduced to within safe operative limits. The specific gravity of the urine should be considered along with the blood-urea, as a persistently low specific gravity is an unfavorable preoperative factor.

SURGICAL CONDITIONS FOLLOWING URETERAL STRICTURES—REPORT OF CASES*

EDMUND H. TEETER, M.D., F.A.C.S.,
Jacksonville.

It is evident that we have been neglectful of the urinary tract for years and it is just in the past few years that we have realized the great importance of a thorough urological study. Pages are being added daily to our knowledge and technique of the kidney tract.

I will endeavor to report a few cases within the fifteen minutes that I am given for this paper.

I will divide my cases into two classes: (1) Conditions resulting from ureteral strictures with stone formation. (2) Conditions resulting from ureteral strictures without stone formation.

(1) Conditions resulting from ureteral strictures with stone formation. It is a fact that urologists realize that urinary calculi are caused by urinary stasis.

Case A: Patient, Mr. H. Referred by Dr. Stanley Erwin of Jacksonville. With the diagnosis of double nephrolithiasis. Entered St. Luke's Hospital on December 10, 1920.

Diagnosis: Double nephrolithiasis. Double ureteral stricture.

Family history: Negative.

Chief complaint: Weakness, lassitude and slight tenderness in right kidney region.

Past history: Negative, except patient passed blood in urine two years previous. Inflammation of bladder twenty-five years previous. Patient was weak and tired easily.

Cystoscopy on December 10, 1920. Pyelogram showed many stones in both kidneys. A differential phenolphthalein done and first hour right kidney excreted 35%. First hour left kidney excreted 5%.

Operation at St. Luke's Hospital on December 11, 1920. Usual lumbar incision made over left kidney. Left kidney delivered into incision and opened from one end to the other and forty-seven stones were removed. Patient had a good recovery and left hospital on January 1, 1921.

Cystoscopy on May 27, 1921, still shows some obstructions in both ureteral orifices as bulb was passed. A differential phenolphthalein was done intravenously, showing right kidney at end of first hour excreted 35%. Left kidney at end of

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first hour excreted 17½%. This shows a great increase in the excretion of left kidney since operation. General health very much improved.

Case B: Patient, Mr. B., age 57.

Family history: Negative.

Past history: Negative except operation five years previous. Removal of right ureteral stone.

Pyelogram shows a stone in right kidney pelvis. Cultures, left kidney and bladder negative. Guinea pig test was negative for tubercle bacilli.

Cystoscopy on March 2, 1925. Bladder wall was normal. Left ureteral orifice stands open and is irregular in outline. Intravenous phenolphthalein shows as follows: Left kidney first hour excreted 40%. Right kidney did not show a trace of phenolphthalein.

Patient entered hospital on March 10, 1925, with diagnosis of stone in right kidney pelvis with atrophy of right kidney.

Operation at St. Luke's Hospital on March 11, 1925. Right nephrectomy. Patient left hospital on March 26, 1925, in a good condition. General health has been good since operation.

Case C: Patient, Mrs. D., female. Age 30. Housewife.

Family history: Negative except father died of Bright's disease.

Diagnosis: Stone in left ureter one inch above the bladder.

Chief complaint. Eight years ago patient began having attacks of left kidney colic. Those attacks have returned several times each year. The attacks have gradually gotten worse for the last year. Attacks were accompanied with severe pain in left kidney, hip, nape of neck, headaches, and vomiting.

Past history: Negative except for headaches and spells of kidney colic. Patient has suffered with indigestion for past five years. Patient gives history of X-ray four years ago showing stone in left ureter. Patient had an operation in 1917. Appendectomy and right oophorectomy.

Cystoscopy on October 12, 1922. Many efforts failed to pass obstruction in left ureter, but a small bougie finally passed the obstructing point. Catheter could not be forced by obstruction.

Cystoscopy on November 22, 1922. Other efforts were made to pass obstruction in left ureter which was about one inch from vesicle orifice. A small bougie passed the obstructing point.

Patient entered hospital on December 15, 1922.

Cystoscopy on December 16, 1922. Efforts were made to get a catheter to pass the obstruction in left ureter and failed. A No. 9 renal catheter and 4 2/3 mm. bulb passed to right kidney. Phenolphthalein test was done intravenously. Appearance time right kidney was four minutes. Total excretion for right kidney first hour 50%. Left kidney did not show a trace of phenolphthalein.

Operation at St. Luke's Hospital on December 26, 1922. Left ureteral lithotomy. Low left incision was made. Stone was removed by incision into ureter which was within an inch of bladder. Patient had an excellent recovery and health has been good since leaving hospital.

Case D: Patient, Mr. S., male. Age 32. Occupation, fireman.

Family history: Negative.

Diagnosis: Left nephrolithiasis, left ureterolithiasis.

Chief complaint: Patient has had pain in left kidney region off and on for past two years. A stone was removed from left ureter by dilatation about one year previous. Six months ago patient took a trip to Atlanta in a Ford and was very sick there for three days. On return to Jacksonville patient was still very sick with pain in left kidney.

Cystoscopy on February 24, 1924. Dilatating left ureteral stricture relieved pain in left kidney although general health did not improve.

Cystoscopy on March 24, 1924. Phenolphtalein test was done intravenously. First hour right kidney excreted 54%. Left kidney did not show a trace of phenolphthalein.

Pyelogram shows a very large left kidney with stones in left ureter and left kidney, also showed a complete loop in ureter.

Operation at St. Luke's Hospital on March 25, 1924. Left kidney was removed, after which the patient recovered very fast and returned home on April 8, 1924. Patient has been well and working since leaving hospital.

Case E: Patient, Mrs. P., female. Age 26.

Family history: Negative.

Entered hospital on December 15, 1922.

Diagnosis: Double ureteral stricture. Double ureterolithiasis. Atrophy of right kidney.

Chief complaint: Patient has had spells of severe pain in kidneys for past six years and pain in right kidney for one and one-half years. Patient took morphine for the pain which subsided gradually and was fairly well until two months before entering hospital; at that time

began having pain in left kidney with nausea, vomiting, headaches, pain in hips and down left leg.

Past history: Negative except headaches all her life.

G. U. history: Patient has had bladder irritation all her life. No history of pus in urine.

Pyelogram made on December 16, 1922. Gives report of stone in both ureters. Large left kidney and no signs of a right kidney. In region of left ureter opposite body of fourth lumbar vertebra there is a stone triangular in shape one and one-fourth by one-half inches.

On right side is a stone four inches above the bladder in right ureter, a rounded stone one-half inch in diameter. Pyelogram shows the pelvis of the left kidney to be represented by six large round areas of erosion with destruction of kidney substance.

Cystoscopy on December 14, 1922. Bladder wall shows some edema and inflammation. A No. 9 renal catheter passed to left kidney meeting a definite obstruction. A phenolphthalein test was done. First one-half hour left kidney excreted 15%. Second one-half hour left kidney excreted 15%. Total phenolphthalein 30%. Appearance time left kidney twenty minutes. No trace of phenolphthalein from right kidney.

Operation on December 20, 1922. Incision was made to left of fourth lumbar vertebra. Stone easily removed by incision into ureter. Stone was not removed from right ureter. Patient had a good recovery and has been in excellenf health since operation.

(2) Conditions resulting from ureteral strictures without stone formation.

Case F: Patient, Mrs. Q. Referred by Dr. J. B. Parramore of Jacksonville.

Family history: Negative. Age 28.

Diagnosis: Right urethral stricture. Right pyonephrosis.

Past history: Negative.

Chief complaint: Patient has had attacks of severe pain in right kidney region with fever, chills, nausea, vomiting, and has had five similar attacks in the past year.

Cystoscopy on November 7, 1922. Stricture of urethra was noted. A No. 9 Kelly cystoscope passed. Bladder wall shows some edema and ureteral orifices show edema and redness. A No. 8 catheter and 4½ mm. bulb passed an obstruction at two definite points in right ureter. Right kidney pelvis held 40 c.c. and on withdrawal of catheter a definite hang was gotten about 7 cm. from outside.

Pyelogram was made which showed left kidney normal. Right kidney is large and upper pole of kidney is at first lumbar vertebra, lower pole lies opposite the fourth lumbar vertebra. Ureter is dilated and is about one-half inch in diameter, has a complete loop in it.

Cystoscopy on November 18, 1922. A No. 9 Kelly cystoscope was passed. There was no change in condition of bladder. No. 9 renal catheter and 5 mm. bulb was passed to right kidney. Right kidney pelvis held 40 c.c. On opening ureteral orifice with a searcher, pus was drained from ureter. Since opening of ureteral strictures at former treatments patient states that she has been free from pain.

Cystoscopy on November 21, 1922. Findings were the same. A 4 2/3 mm. bulb was passed to right kidney. Right kidney pelvis held 90 c.c. Cloudy urine and pus drained from right kidney.

Cystoscopy on November 24, 1922. A differential phenolphthalein test was made; 1 c.c. of phenolphthalein was given intravenously. First one-half hour left kidney excreted 30%. Second one-half hour left kidney excreted 15%. Total phenolphthalein 45%. Appearance time left kidney three and one-half minutes. No trace of phenolphthalein from right kidney.

Guinea pig test was negative for tuberculosis. Culture showed staphylococci and a few bacilli.

Operation on November 27, 1922. Right nephrectomy. Patient had an excellent recovery and has been well since.

Case G: Patient, Miss S. Referred by Dr. H. B. Harkness, Lake City. Entered St. Luke's Hospital on January 22, 1926. Very weak. Temperature, 105. Pulse, 120.

Diagnosis: Double ureteral stricture. Left pyonephrosis.

Age, 35. Family history: Negative.

Chief complaint: Weakness, vomiting, loss of appetite, pain in right abdomen, right hip, epigastrium and in right leg.

Past history: Negative, except for headaches, indigestion, and constipation for the past five years. Patient gives history of having flu five years ago; at that time was in bed two or three weeks. Patient has not been well since that attack of flu.

G. U. history: There is no history of bladder irritation. Patient has never thought she had kidney trouble. Has been treated for pleurisy

on right side. In the last month doctor reported pus in urine.

Physical examination: Patient is well developed but shows some loss of weight and has a decided jaundice. General physical negative except severe pain and tenderness in right upper quadrant of abdomen.

Cystoscopy on January 22, 1926. Bladder wall was inflamed. A No. 9 renal catheter and 4 mm. bulb passed to both kidneys. A hang was gotten in both ureteral orifices as bulb was withdrawn. Differential phenolphthalein was done. Right kidney appearance time six minutes. 21% of phenolphthalein eliminated from right kidney first thirty minutes. Left kidney drained a thick mucus. No trace of phenolphthalein from left kidney.

Guinea pig test was negative for tuberculosis. Blood Wassermann was negative. Widal negative. Culture from bladder and left kidney showed staphylococci.

Pyelogram on January 28, 1926. Shows left kidney shadow to be approximately nine inches long and five inches wide. Entire ureter is about twice normal size. Pelvis and calyces show extreme dilatation. There is no evidence of urinary calculi. Injection did not fill pelvis and calyces completely.

Cystoscopy on January 29, 1926. No. 9 renal catheter and 5 mm. bulb was passed to both kidneys. General condition has gradually improved. A definite obstruction was noted and a definite hang was gotten in both ureteral orifices.

Cystoscopy on February 8, 1926. No. 10 renal catheter and 5 1/3 mm. bulb was passed to both kidneys. A differential phenolphthalein was done. Right kidney first one-half hour excreted 30%. Appearance time right kidney four minutes. Left kidney did not excrete a trace of phenolphthalein

Operation on February 10, 1926. Left nephorectomy through the usual lumbar incision. Patient's recovery was good. She left hospital on February 25, 1926. Patient gained weight and general health is good.

Case H: Patient, Mr. M. Reported to me on May 23, 1922.

Diagnosis: Double ureteral stricture with ulceration.

Age, 35. Family history: Negative. Past history: Negative.

Chief complaint: Patient has had severe hemorrhage from bladder, but has never suffered pain in kidney or bladder region.

Cystoscopy on May 24, 1922. Shows a definite drainage of blood from both ureteral orifices. No. 3 mm. bulb on bougie could not be forced to either kidney. No. 7 bougie was then passed to both kidneys, also No. 8 bougie was passed to both kidneys. After passing bougies there was so much bleeding from ureters it was impossible to pass catheter to either kidney.

Cystoscopy on June 20, 1922. Bladder wall was normal. A No. 6 and No. 8 bougie again passed to both kidneys. A definite obstruction was noted on passage of both bougies. A No. 6 renal catheter passed to right kidney. Patient's right kidney pelvis held 14 c.c. Patient seems to get no relief from hemorrhages from former cystoscopies.

Patient had cystoscopies at intervals between May 24, 1922, to September 12, 1922, with very much cessation of hemorrhage. On September 12, 1922, a catheter was passed to both kidneys and pyelogram was made. No definite pathology was noted with X-ray. No stones diagnosed. Patient gained in strength and there has been no subsequent hemorrhage from bladder.

I wish to emphasize the following points in connection with these cases:

1. Ureteral stricture ulcers with hemorrhage explain cases known as idiopathic hæmaturia.

2. Stasis of the urine will cause stone formation with or without infection.

3. Ureteral strictures may cause pyonephrosis or hydronephrosis with cessation of kidney function.

4. In pyelitis where there is good drainage the kidney will generally clear its infection rapidly.

5. In dilatation of the ureteral stricture in pyelitis the same result is obtained as in the opening of an abscess.

6. If good drainage of a blocked kidney is obtained the function will gradually increase to a certain per cent, dependent upon the degree of destruction of the kidney cells.

7. A thorough dilatation of ureteral strictures in hydronephrosis or pyonephrosis relieves pain.

DISCUSSION.

Dr. B. F. Woolsey, Jacksonville:

I certainly want to congratulate Dr. Teeter on the splendid number of cases he is able to present. Personally, I have not seen so many cases as Dr. Teeter, either in hospital or private practice. However, they are recognized more generally now than they used to be.

Ureteral stricture as a definite clinical pathological entity can no longer be questioned.

I would like to add a word of caution to the inexperienced cystoscopist. Ureteral stricture is identical with stricture of the urethra, and in my opinion, a diagnosis of stricture of either the ureter or urethra should only be made with the acorn-tipped bougie. As the bulb of the bougie passes the stricture a decided "grasp" or "hang" is felt by the examiner, both on entrance and withdrawal. As Dr. Walther so aptly states, "A ureteral stricture cannot be diagnosed by a No. 6 F. ureteral catheter."

Dr. Teeter has covered the pathological aspect in his article and his rœntgenographic studies are quite complete. Unfortunately it is rather difficult to demonstrate the actual stricture by X-ray, but the resulting pathology is well shown The pathological results of ureteral stricture are namely: inflammation, either acute or chronic, infiltration, scar and contracture. Alterations in the calibre of the canal affect the ureter above and below the stricture and the result is dilatation above and atony below, with more or less intermittent or chronic discharge of mucus, pus, or blood, the same as in urethral stricture. In the kidney, the result of ureteral stricture is at first dilatation of the pelvis and then hydronephrosis and finally pyonephrosis. A partial stricture which suddenly becomes complete produces a cessation of renal function.

Dr. W. R. Jamieson states that in some cases the inflammation may come from contiguous structures and be limited to the peri-ureteral tissue. He refers to another observer who studied the lower end of ureters in the bodies of 25 patients with cystitis, dying from other causes, and in all he found changes of an inflammatory type in the submucosa and muscularis. He expressed the opinion that the inflammation extended along the lymphatics and not the mucosa. So, there seems to be some variation of opinion on the subject of the real pathology.

Strictures may be annular in contour or may be of the linear type, but they are usually of the former. They may vary from a soft infiltration to a hard dense fibrous scar formation one cm. or more in width.

Dr. Teeter has covered the treatment very thoroughly, so I will not go into it except to say that an early diagnosis is most essential to obviate renal complications such as Dr. Teeter has shown. Various dilating instruments are on the market, which when used properly, give fairly satisfactory results. Of course the resulting renal complications must be taken care of if damage has been done there by stone or infection.

I see frequent mention by the French urologists of using "electrolysis" for dilatation of strictures. This is not in general use in this country. Personally, I have never tried it, and would like to know if Dr. Teeter has, and if so, what his results have been.

CONCLUSION.

Dr. Edmund H. Teeter, Jacksonville:

Gentlemen: I hope that you have received something from this paper.

First, I want to thank Dr. Woolsey for his discussion and Dr. McEuen, who helped me to get up these lantern slides.

I just want to say that the kidney tract is a big field and we have not done it all yet. There are thousands of people who are suffering from some kidney tract condition. If we keep our eyes open, we will find many that we have missed in the past.

ANTERIOR POLIOMYELITIS OR INFANTILE PARALYSIS*

F. L. Fort, M.D.,

Director Bureau of Crippled Children, Florida State Board of Health,

Jacksonville.

Of all the deformities, both congenital and acquired, which the orthopedic surgeon is called upon to treat, the great majority of them result from the ravages of infantile paralysis. Over half of the cases I have seen in Florida are old poliomyelitis cases. We have new cases occurring every year and last year there was probably two hundred new ones added to the list. The disease is endemic here in Florida; although it appears in epidemic proportions at times. It seems proper that we should discuss this disease now, because I am persuaded that the majority of the deformities we are called upon to treat could have been prevented with proper care, and that many cases of extensive paralysis would be much less severe if the general practitioner had advised them more wisely. For it will always be the family physician's duty and privilege to guide these patients through the critical convalescent stage.

It is an acute infectious disease that involves principally the nervous system, and especially the spinal cord. It is caused by an ultra-microscopic germ or virus, which apparently gains

*Read before the Staff of St. Luke's Hospital, Jacksonville, November, 1926.

CASE NO. 1.—Left leg flail and useless. Walks without crutches and very little limp after one foot operation and the use of a leg brace for weak knee.

entrance through the upper respiratory tracts. It spreads along the lines of human travel during an epidemic. Transmission of the disease is by direct contact, and also by intermediate carriers, who are not susceptible to the disease. One attack confers immunity, while with increasing age there is an increasing acquired immunity. It is principally a disease of childhood; seventy-five per cent of all cases occurring before the seventh year. It is seldom that more than one member of a household is affected in the same year. Monkeys are susceptible to the disease, and it can be transmitted from one to another through the injection (intraspinal) of spinal fluid or salivary secretions during the acute stage. Recent cases are contagious as long as the nasopharyngitis persist; and should therefore be quarantined from two to three weeks, or until nasal discharges cease. All "contacts" should be isolated from other children. The incubation period is four to fourteen days.

The pathology is that of an acute interstitial meningitis, especially on the anterior surface of the spinal cord. The cord shows hyperemia and round cell infiltration, or perivascular infiltration. There is an extensive edema and many minute hemorrhages, particularly in the anterior or motor area of the cord. The damage to the cord results from three causes: first, direct pressure on the nerve cells by hemorrhage, edema and exudate; second, anemia, due to pressure on blood vessels; third, to direct toxic action on the nerve cells. The involved nerve cells may be out of commission temporarily only, but if the anemia and edema persist too long, there is permanent death of the motor nerve cells involved, and the paralysis is permanent.

SYMPTOMS.

We can divide these into three stages. It is necessary to consider the symptoms more in detail in order to discuss the treatment properly.

The state of onset is generally characterized by a high fever of 103°-104°, which subsides gradually in from three to five days. Gastro-intestinal upsets are very frequently the outstanding symptom, with nausea, vomiting or diarrhœa. There is sweating, nervous irritability, and sometimes convulsions. Stiffness of the neck muscles is frequently encountered. Hyperesthesia of the nerve trunks and muscles involved is a rather constant finding in the acute stage. Some few cases, however, have none of these premonitary symptoms; and the paralysis is the first thing observed.

The second or convalescent stage lasts for about two years. The edema of the cord or meninges gradually subsides; the hemorrhages are slowly absorbed, and the small cell infiltration diminishes, until the motor area of the brain can send impulses out to the affected muscles. This clearing-up process, together with the formation of new association tracts, lasts for about two years; although the most rapid improvement is seen in the first six months after onset.

The third or chronic stage, succeeding the convalescent stage, begins about two years after onset and remains practically unchanged. The destroyed areas of the cord show only glioses. No further spontaneous improvement occurs, except from treatment. Tendon contractures and deformities from muscle unbalance gradually develop. The paralyzed limb is atrophied and feels cold and clammy and looks bluish, due to poor circulation. The muscles are soft and flabby. There is no loss of sensation. The poor circulation is due to vaso-motor disturbance, as well as to loss of muscle functioning. The degree

of retardation of growth depends upon the extent of the paralysis, and upon the age of onset. The leg paralyzed at one year of age is much worse atrophied than the ten-year-old child's would be. The degree of deformity or crippling is determined largely by the muscular unbalance, as well as by the extent and location of the paralysis. An active muscle with its physiological opponent paralyzed, is more of a deforming factor than if both were gone.

The third or chronic stage is the proper time for restoring muscle balance, so far as possible, by transplanting muscles, stiffening or bracing flail joints and lengthening shortened tendons, or other corrective and educational treatment.

DIAGNOSIS.

At the stage of onset there is little that is characteristic from any other acute infection. During the summer months, any obscure fever or infection in a child should make one suspicious; especially if there is an epidemic of anterior poliomyelitis. If the patient is nervous, irritable, hyperesthetic, or has a stiff neck, a lumbar puncture should be done. This is the only way of diagnosing any case before the paralysis occurs. Slight paralysis or abortive cases then will not be overlooked and isolation can be instituted at once.

The spinal fluid in acute poliomyelitis is clear, colorless, and under slightly increased pressure. There is an increase of cell count sometimes up to 1200 per c.c., which is of the small mononuclear leukocytes. This increased cell count persists for about one month. There is also a marked increase of globulin in early infantile cases. Besides the spinal puncture, tenderness is one of the most constant and characteristic signs of poliomyelitis. Hyperesthesia is seldom absent, especially in the muscles paralyzed. After the paralysis appears it is recognized as being a *pure* motor flaccid paralysis of erratic distribution. Weakening or partial paralysis is more common than total paralysis. The reflexes are abolished or weakened; the reaction of degeneration is present after about one week; while the muscles soon become atrophied.

Nerve lesions, resulting in paralysis from *other* diseases like transverse myelitis, hematomyelia, or peripheral nerve lesions are usually accompanied by sensory disturbances. Multiple neuritis generally is gradual in onset and a sequelæ of some bacterial or metallic poisoning. Lead and arsenic palsy usually affects the extensors of the wrist and is symmetrical. The history of infectious diseases, like diphtheria, should give us a fair idea of the nature of such paralysis. The history and distribution of obstetrical paralysis should give us little trouble in making a diagnosis. Occasionally we see a pseudo-paralysis occurring in constitutional diseases like rickets. A pin prick in the supposedly paralyzed limb will generally eliminate poliomyelitis from consideration. Spastic paralysis of cerebral origin, regardless of the etiology, probably is not epidemic poliomyelitis. Occasionally there is seen a cerebral type of poliomyelitis which may affect the cerebral meninges or the motor area of the cortex of the brain. This usually results in a hemiplegia, with a variable amount of spastic paralysis and cerebral incoordination. It is not within the province of this discussion to take up the several types of cerebral poliomyelitis now recognized. The high points to remember in making a diagnosis are few, but definite. Infantile paralysis is a *pure* motor flaccid paralysis of irregular distribution; usually affecting a child in the summer months.

CASE NO. 2.—Talipes equinus—right foot. Before and after operation.

CASE NO. 3.—Club foot of severe degree on left and right flat foot. Corrected by one operation on right and two operations on left.

THE PROGNOSIS

As to life, statistics give not over twelve per cent as an average mortality. If all cases were recognized, it would probably be even less. The prognosis as to function depends upon the location and extent of the original paralysis, and age of onset, as well as upon the subsequent treatment. All cases have some spontaneous improvement, with no treatment at all. With proper treatment the percentage of improvement is greatly increased, while many of the later disabling deformities can be prevented, or if allowed to occur, can be corrected in most cases. Twenty-five per cent of all cases recover entirely.

Before taking up the treatment it seems proper to consider the distribution of the paralysis and the types of deformity resulting from the paralysis. The lower extremities are far more frequently paralyzed than the upper. Of 2418 cases reported by several authorities, 1765 had permanent paralysis in the lower extremities only, as compared with 195 cases in which the arms alone were involved. The deltoid muscle is more often permanently paralyzed than any other one arm or forearm muscle. The extensor muscles are more often involved than the flexor groups, in both extremities. In the thigh the quadriceps is most often paralyzed. The lower leg is the most frequent site of permanent paralysis and here again the anterior or extensor group of muscles are affected much oftener than the posterior or flexon group of muscles.

The deformities resulting from anterior poliomyelitis are caused by: 1. Force of gravity. 2. Unopposed muscle action or unbalanced muscle power, and, 3. By functional disuse in abnormal postures or positions. Talipes equinus is found most often of all deformities. Talipes valgus, or flat foot, is the next most common deformity. Both are due to partial or complete paralysis of one or more of the anterior or extensor muscles of the foot. Talipes calcaneus is not as often seen as is club foot. Occasionally we see knee flexion deformities, due to contracted hamstrings, but most often the knee has no extension power, from paralysis of the quadriceps. Flexion deformity of the hip is a very common occurrence. Lateral curvature of the spine is a frequent and very troublesome deformity, which tends to increase with age, due to gravity and unbalanced muscle pull on the flexible vertebræ column. The upper extremities seldom present correctible deformities. The loss of abduction power with a weak shoulder girdle, especially the deltoid, is undoubtedly aggravated by gravity, pulling constantly on weakened muscles. The elbow never presents any deformity other than weakness. Wrist drop is seldom encountered, but loss of ability to oppose thumb and fingers is not a rare disability.

Facial paralysis is very rare and always recovers. Involvement of the external respiratory muscles is a serious occurrence, and is the usual cause of death in the acute stages.

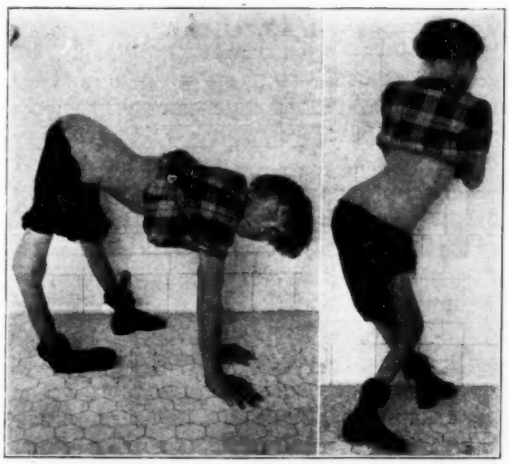
TREATMENT.

In the acute stage this concerns the medical man or practitioner more than the orthopedist. Treatment is largely symptomatic in the febrile stage. It should consist largely of rest, and avoidance of irritation. Saline catharsis seems rational to reduce the edema of the cord. Lumbar puncture also relieves the increased intraspinal pressure as well as confirms the diagnosis. Hexamethylamine is the only drug indicated, which theoretically retards or inhibits spinal infection. Serum from patients who have had the disease, if given *early*, appears to arrest or abort some cases. Brilliant results have been reported

during the past year from this form of therapy. A serum is now on the market, but its value is not conclusively proven yet.

Fixation of the paralyzed and tender muscles in well padded plaster cast is desirable in the acute stage. When the trunk or neck is involved recumbancy on a Bradford frame is the best method. Warm saline baths and local heat to maintain circulation improve the nutrition of the affected parts. Massages and exercises of all kinds should be strictly forbidden until all muscle tenderness has disappeared. The tenderness will be unduly prolonged or will return if massage and active use is begun too early. Massages only irritate an already inflamed or hypersensitive nerve ending, coming from an inflamed area in the spinal cord. It is just as illogical or anti-physiological to use the tender or inflamed muscles as it is to use or irritate an acutely inflamed joint.

I do not expect all of you to agree with me, but I feel quite positively that there is no benefit at all to be derived from the use of electricity in any form, in the treatment of infantile paralysis. On the contrary it is definitely harmful in most cases. This is quite the opposite opinion with the general public, and also of most of the profession. Electricity is not tolerated well by children, and their cooperation is immediately lost. Exercises should be voluntary or with brain and muscle coordinating. The sudden violent contractions caused by electrical stimuli may actually rupture a damaged muscle, or at least drive it to work beyond its capacity. Because one muscle is dead, another one-tenth normal in power, while a third muscle, all of the same group, may not be affected at all. The current cannot be regulated to the individual muscles and one is greatly over-stimulated while the one next to it has not enough stimulus to exercise it. The use of electricity as a therapeutic agent has been entirely abandoned in the larger clinics, especially in the acute and sub-acute stages. The most important part of the treatment, for the early stages at least, is the prevention of deformity, which otherwise inevitably results. If the trunk is involved, recumbancy should be enforced, until recovery or until properly braced. If there is wrist drop, cock-up splints should be applied. Deltoid paralysis is best treated by a platform or obduction arm splint. The legs and feet should be supported in the neutral position; namely, thighs



CASE No. 4.—Extensive paralysis of both legs and trunk muscles with multiple deformities. Quadruped type of locomotion.

extended, knees straight and foot at right angle to the leg. The leg can be adequately protected from over-use and from developing deformities by keeping it fastened in a posterior wire splint with foot piece attached to prevent drop foot. Bracing should be continued as long as there is any tendency towards developing deformity.

Massages, very light at first, can be instituted as soon as all tenderness disappears. Active and passive motion should be done daily up to the point of fatigue. The pernicious practice of trying to make a child walk when the leg muscles are one-half to one-tenth their normal strength, cannot be too strongly condemned. This is a point most of us must unlearn. We are taught that to exercise a muscle is to make it bigger and stronger. This is true to a degree. But to work a sick muscle beyond its capacity or to the point of exhaustion, weakens it still more or may actually kill it permanently. No walking should be permitted until the muscles are practically back to normal, or are properly protected by braces. After walking is resumed there is almost no further return to power of paralyzed muscles. While often weakened muscles become permanently disabled from overwork or stretching, when used too soon or improperly braced, there need be no fear of stiff joints resulting from prolonged disuse, for it doesn't occur in infantile paralysis. The best thing to do in most cases is the hardest to do, and that is to do nothing in the way of walking or standing for six months to one year.

TREATMENT.

The subacute stage is largely orthopedic. No definite outline of treatment can be formulated on paper for the subacute cases. The more severe the disease the longer should be the convalscent period. Walking is to be allowed only when there is no marked muscle weakness, or only when well braced. This is particularly true of the first year after onset. Weak muscles can be permanently paralyzed if used too long or too vigorously. Deformities are much easier prevented than they are corrected. Exercises of weak muscles should be given daily to the point of fatigue—but should not be used to the stage of exhaustion. There should be no cutting operations for correction of deformity during the first year and very few during the second year. Wait till all hope of further recovery of paralyzed muscles returning to life has vanished. There is one point I hope to impress on you, and that is, that to *overwork* a weak muscle will only make it weaker instead of stronger.

The indications for treatment in the third or chronic stage are two: 1. Correction of acquired deformities and prevention of further deformities. 2. Balancing of muscle power and increasing the efficiency of what power remains. Contracted tendons, joint capsules, fascia, etc., can be gradually corrected by stretching in most cases, for from one to two years after onset. Later, as the contracture becomes more fixed and less elastic, tenotomies, tenton lengthenings, fasciotomies, and stripping operations are resorted to. Deformities from joint subluxations, or dislocations require orthopedic operations many times. Where operative stabilization is not possible, braces must be used to stabilize joints and prevent deformities. In some cases we use the bone skeleton for braces, and arthrodese joints that can be sacrificed. Arthrodesing operations are most feasible in the foot, where the majority of our deformities occur. Occasionally we find it advantageous to stiffen *one* knee or hip, shoulder, elbow, or wrist, when they are flail and not easily braced. Recently spinal fusion has come into rather general use as a means of bracing a curved spine, which we cannot hold otherwise. There is practically no deformity of the foot which cannot be largely corrected, and maintained, to look like a normal foot in a shoe; even though there is not a flicker of muscle power below the knee. Tendon transplantation of live or active muscles to take the place of paralyzed muscles has not proven to be as useful a procedure as it first promised. Making a flexor muscle out of an extensor muscle, or vice versa, is anti-physiological, and it is hard to educate such a transformed muscle to function properly. Besides there is generally a loss of power in such

CASE NO. 4.—After stabilizing right foot and double hip operation to correct thigh flexion. Walks very well with crutches, corset and double leg braces.

transplantations. For a drop foot deformity we can sometimes use the long toe extensor tendons as stay ligaments by fixing them into the bone just above the ankle, or we may stiffen the mid-tarsal joint with benefit. A transplanted peroneal tendon to take the place of a paralyzed anterior tibial muscle, with flat foot works beautifully sometimes. Valgus deformity, due to *over* acting peroneal muscles, is helped by removing the peroneals to a neutral position. In case of a calcaneus deformity, the peroneals or the posterior tibial muscle may be transplanted into the heel with much improvement.

For paralysis of the quadriceps muscle with a weak knee, we sometimes transplant one medial and the lateral hamstring into the patella. Transplantation of muscles about the hips and shoulders has not been of any material benefit. In the forearm and hand there are many combinations of transplants which can be worked out to advantage. Wrist drop can be overcome, and apposition of the thumb and fingers greatly benefited, in many cases. Results of tendon transplants in the hand are far more successful than anywhere

else, although it is seldom that we see cases involving the hand to any great extent. This is because the hand muscles are not overloaded or abused like those in the lower extremities, by walking too soon.

Braces are used to stabilize weak or flail joints, and to prevent deformity which cannot be corrected or prevented otherwise. Braces should not be used in the chronic stage whenever it is possible to avoid them.

CONGENITAL PYLORIC STENOSIS*

J. C. Davis, Jr., M.D.,
Quincy.

This condition was first accurately described by Beardsley, in 1788, but it remained for Hirschsprung, in 1888, to call the general attention of the profession to the present conception of the pathology. More recently the work of Weber, Ramstedt, Keefe, Downs, and others is to be commended, as it is through their work and efforts that we have been able to reduce the mortality to practically nil.

While formerly this condition was considered quite rare, owing to the simplicity of operative methods, awakened interest in the subject and a closer study of the symptomology, we now realize that it is by no means a rare condition but, heretofore, simply overlooked.

The typical, classical text-book symptoms are not always present and identical, but the majority of cases present the following classical conditions: More common in males, first born and by some authors more frequent in those artificially fed and others those breast fed. In the first stage there are no symptoms, *i. e.*, there is a period when undoubtedly an anomaly exists, prior to the development of clinical symptoms. The disease usually declares itself between the eighth day and eighth week. Vomiting ushers in the symptoms and is a characteristic feature. It occurs shortly after nursing, after each, or only after several feedings. The vomiting is forceful and projective, the stomach contents being sometimes expelled several feet from the infant. The quantity, as a rule, is large and represents the entire feeding. On account of the frequency of vomiting the patient is persistently hungry, although not infrequently anorexia; the child's nutrition suffers; there is a loss of weight, and often emaciation; weakness supervenes. Later on, especially when dilatation occurs, there are signs of retention, the urine is diminished in quantity, the tissues are dry, there is constipation and evidence of toxemia. The epigastrium is prominent, visible peristalsis may be seen in the abdomen and not infrequently a tumor is palpable, usually about the size of a walnut. The typical syndrone may occur without evidence otherwise of pyloric stenosis.

With the above symptoms, evidence of mechanical obstruction is unquestionable. There are cases that are reported with spitting of blood-tinged fluid the first day after birth, persistent diarrhœa and anorexia, no pain, the stools green and yellow with fat curds.

It is a clinical fact that a number of children presenting these symptoms have been cured by medical treatment or recovered in spite of medical treatment without surgical interference. Yet to my mind, these were not true cases of pyloric stenosis but merely cases of pylorospasm, which is brought about by local irritation of the mucosa of the pylorus, as occurs in erosion, fissures, ulcers, neoplasms involving the pylorus or by conditions associated with gastric hyperacidity or by reflex irritations from inflammatory conditions elsewhere in the abdomen as frequently observed in disturbances of the duodenum, diseases of the biliary tract, the pancreas and the appendix. There are, however, instances of functional pylorospasm which are in all probability the result of excessive vagal stimulation.

Differential Diagnosis: (1) The possibility of mere indigestion excludes the usual signs of stenosis; (2) congenital atresia of the duodenum. This may simulate congenital pyloric stenosis. The patients, however, usually live only a few days. The vomiting is usually bilious in character in contra-distinction to the absence of bile in a true stenosis of the pylorus, though this depends on whether the obstruction is above or below the common duct. (3) pylorospasm.

Treatment: In all cases it is advisable to try medical treatment first. This should be done in order to complete the differential diagnosis. Hutchinson recommends the following regime: (1) Regulate the diet, so that the child is fed small quantities at frequent intervals, (2) lavage of stomach once or twice daily, (3) small saline enemata (2 oz.) twice daily to make up for loss of fluids. If there is no improvement in three or four weeks, surgical treatment offers the only probability of a cure.

Most authorities agree that if after ten days

*Read before the Second District County Medical Society, Tallahassee, June 14, 1926.

the treatment is unsatisfactory, operation is indicated. All in all, medical treatment is of no avail where a definite stenosis exists. Of all the drugs that have been recommended, atropine is, perhaps, the only one from which beneficial results can be expected. It can be given in the form of drops added to the feedings, from two to ten drops of a 1-1000 solution being used in twenty-four hours. Warm compresses may afford some relief, and should be applied with a binder.

Surgical Treatment: The indications for surgical treatment are: (1) Persistent vomiting, (2) absolute constipation, (3) poor general condition, (4) evidence of obstruction. Operation should never be performed as an emergency, patients should always be carefully prepared with lavage and infusion for at least four days if possible.

The essentials of the technique in operation are: (1) Gentleness, (2) speed, (3) local anesthesia, (4) minimum manipulation, (5) incision as near convex upper surface as possible, (6) division of tumor along entire length, (7) control of bleeding with a few mattress sutures (00 Gut).

The technique of the Ramstedt operation and the after-treatment will be covered with a report of two cases that I personally operated upon as follows:

Case 1: Baby G. G. Date called, April 21, 1920. Date operated, May 11, 1920. Male, breast fed, second child, weight at birth eight pounds. Illness began at five weeks six days, weight twelve pounds. The child was healthy and vigorous up to the time the vomiting began. The vomiting was of sudden onset.

I saw this child in consultation with Doctor Galphin, of Havana, four days after onset. At this time the child had vomited after each feeding, which was projectile in character, had been obstinately constipated, diminished amount of urine. After exposing the child's abdomen and noticing that it was quite flaccid, I had them give the child two ounces of sweetened water and watched for the gastric wave. In less than three minutes after taking the water the child showed typical gastric peristalsis crossing the median line; this was so distinct as to cause a considerable bulging of the left rectus muscle with one continual wave after another for about ten minutes, when there was a reverse wave which emptied the stomach and the vomit projected two or three feet from the child. This clinched the diagnosis in my mind. No tumor was palpable at that time. According to the various authorities I had read on the subject since 1914, I reluctantly advised that we do a Ramstedt operation. This the parents did not see their way clear in submitting to without first a chance with medical treatment. With this condition staring us in the face, Doctor Galphin and I came to the conclusion that we would try liquid petrolatum in dram doses, three times daily, also two minims of benzyl-benzoate in sweetened water every four hours, with the idea, if this was only a functional reflex pylorospasm, that by gentle lubrication and relaxation we would probably theoretically be doing something. It is interesting to note that after this medication some food began to pass from the stomach to the bowels. Vomiting became less often and the child remained at a standstill in weight for one week, after which he began to lose two ounces daily for a few days, but going twelve hours without vomiting. In fact, at one time he went twenty-nine hours without vomiting and in two days gained four ounces, after which he began losing two ounces daily, until he weighed only nine pounds. At this time I was able to convince the parents that if the child was not gaining in weight he was losing, aside from the fact they could see the amount of daily loss. Three weeks now had elapsed since the beginning of the symptoms above mentioned. At this time I was able to palpate a small tumor at the pylorus. The child was brought to the hospital and a Ramstedt operation done.

A one-half of a one per cent novocain solution was the anesthetic employed. An incision two and one-half inches in the right rectus above the umbilicus was made. On examination, the pylorus muscle was found greatly enlarged and a very hard cartilaginous-like tumor was demonstrated. This was incised on the posterior part, beginning at the cardia side and extending toward the duodenum. The muscle was gradually separated from the mucous membrane in its entire length, so that the mucous membrane bulged at least one-eighth of an inch the whole length of the incision. The abdomen was closed in the usual manner. Operation was completed in fifteen minutes. The child suffered little shock and immediately after leaving the table was given one dram of mother's milk with one dram of barley water. Feedings were continued every three hours, increasing one dram of breast milk every other feeding until we were giving one ounce every three hours during the day and

every four hours at night. After five days the child was allowed to nurse the mother. Castor oil was given twenty-four hours after the operation. The child left the hospital on the tenth day with eight ounces gain in weight. The child made complete recovery and is now six years old and a fine boy.

Case 2: Baby L. D. M., male. First-born. Weight at birth eight pounds. At one week child began having large wine-colored stools, three or four times daily. This condition persisted until the child was three weeks five days old, a doctor was called, he gave a bismuth mixture for diarrhœa. Child had been jaundiced throughout but had cleared up to return again, more marked than the first. The child began to vomit or spit up its food, occasionally at first. After the fourth week obstinate constipation began and everything taken by mouth came back immediately, rapid loss of weight, increased thirst and diminished and highly colored urine, gastric peristalsis but no projectile vomiting as in Case 1. Child just opened mouth and food poured out. Child given retention enemas of soda and glucose for one week. Tumor was not palpable until day of operation.

On fifth week, after one week of medical treatment and diagnosis unquestionable in my mind, confirmed by Doctors Moore and Mack, a two-inch right rectus skin incision above umbilicus was made, following infiltration of area with one-half of a one per cent novocain solution. The pylorus was fixed by adhesions well under liver in close proximity to gall bladder. The entire pylorus was edematous and presented a glistening appearance as found in any constricted area before the onset of a gangrenous condition. After freeing the pylorus from its bed of adhesions the serous and muscular coats were divided along the convex curvature of stomach and the submucosa allowed to bulge well into wound the entire length of the annular muscle. Twenty c.c. of mother's blood was given subcutaneously at conclusion of operation on account of marked jaundice. Wound closed and same after-treatment as instituted in Case 1. Child made uninterrupted recovery.

Both the above were males, one first-born, the other second, both breast fed, one had diarrhœa and wine-colored stools accompanied with jaundice; the other persistently constipated. One had projectile vomiting, the other did not. The tumor was more easily palpable in Case 1 with a much smaller tumor. The development of the pyloric muscle accompanied by edema in Case 2 was probably due to pylorospasm induced by adhesions constricting pylorus and being twisted on itself.

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Take $10.00 or a blank check to the January meeting of your county medical society.

TO SECRETARIES:

Revise and bring up-to-date, the roster mailed to you December 20th.

One delegate to be elected for each twenty paid members or fraction thereof.

1926 MEMBERSHIP . . . 1108

1927 " . . . . . ?

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SIXTEENTH DISTRICT—DR. M. M. HANNUM . . . . *Eustis*
Sumter, Lake.
SEVENTEENTH DISTRICT—DR. JOHN S. MCEWAN . *Orlando*
Osceola, Orange.
EIGHTEENTH DISTRICT—DR. S. G. HOLLINGSWORTH . *Bradenton*
Manatee, Sarasota.
NINETEENTH DISTRICT—DR. D. L. MCSWAIN . . . *Arcadia*
DeSoto, Hardee, Highlands.
TWENTIETH DISTRICT—DR. WM. R. WARREN . . . *Key West*
Monroe.
TWENTY-FIRST DISTRICT—DR. ROBT. C. BOOTHE . *Fort Pierce*
St. Lucie, Okeechobee, Indian River, Martin.

PROTECTION BY VACCINATION

There is no law in Florida requiring vaccination against smallpox. During the calendar year 1925, 206 cases of smallpox were reported to the State Board of Health. So far this year, 2,546 cases have been reported and eight deaths have resulted, one of the deceased having been a school teacher. Those who are directing the education of our children certainly should believe in vaccination against smallpox. Eight is not as large a number as reported from many other causes. However, when protection against smallpox is right at our door, it seems criminal for eight deaths to occur from this cause in our wonderful state of sunshine.

Press release bulletins Nos. 12 and 14 from the Conference of State and Provincial Health Authorities, on "Saving Money on Smallpox" and "What Might Happen Without Vaccination," by Dr. Hugh S. Cumming, surgeon general of the United States Public Health Service, emphasizes in a very striking manner the necessity of vaccination against smallpox. Extracts

from these press releases are quoted as follows:

"We frequently hear someone express the idea that vaccination is just a plan of the doctors to get business. Such an idea is too absurd to discuss, for one has only to look up the facts in regard to the cost of vaccination compared with the cost of smallpox epidemics to a community.

"The Secretary of the Michigan State Board of Health stated a few years ago that it cost Michigan $150,000 a year to take care of indigent smallpox patients and to protect the unvaccinated. The Secretary of the Kentucky State Board of Health, in reporting upon an outbreak of smallpox in that State in 1901, said that the actual cash expended during that epidemic by counties and cities, on account of smallpox, was $308,271, not including the expense to individuals. The reported loss from interference with business was $734,000. This did not include the great loss to transportation companies from interference with travel and commerce. He says, 'these are the bare, naked figures in regard to the most expensive and widespread epidemic from which the State has ever suffered, and covers an experience which might have been easily avoided had heed been given to the united voice of the medical profession and the repeated warnings of state, city, and county health officers urging universal vaccination.' In a circular issued by the Kentucky State Board of Health entitled 'How to Combat Smallpox,' it is stated that smallpox during a period of a few years had cost county and city treasuries $515,775 actual cash and an estimated loss from interference with business and travel of $1,227,435. This circular stated that 'judiciously expended, this would be more than enough to keep every person in Kentucky vaccinated for a generation, so that the existence of anything but an imported case of smallpox would be an impossibility.'

"Professor Irving Fisher, in his report on National Vitality, states that the economic loss to Philadelphia caused by the smallpox epidemics of 1871 and 1872 was estimated by Dr. Lee at $22,000,000. In a bulletin (No. 7) of the Wisconsin State Board of Health, the statement is made that Saginaw, Michigan, spent $75,000 in quarantining and treating smallpox and that 48 citizens died of the disease. Grand Rapids, Michigan, a city over twice as large as Saginaw, spent $2,693 for vaccination and not a single case of smallpox occurred in that city. . . . . .

"The Health Commissioner of the City of St. Louis said in an address before the Optimists Club in that city on December 11, 1924, that it cost the city more than $150 to care for every case of smallpox, but to prevent a case of smallpox by means of vaccination cost less than one-thousandth as much.

"The claim is made that vaccination is dangerous. The medical officers of the navy have vaccinated since 1917 approximately three-fourths of a million persons without a death. Medical officers of the army have, during this period, vaccinated five and one-fourth million persons. Only one of these nearly six million men died during the course of vaccination and this man died of pneumonia. The Detroit vaccination figures also show that practically anyone may be safely vaccinated against smallpox. There were 817,000 persons vaccinated in Detroit during 1924 without a death or serious accident. Of these about 500,000 were vaccinated in May or early in June. Smallpox had constantly increased up to the end of May. The outbreak terminated the latter part of July. . . . . .

"The Detroit Health Department has figured out the time lost on account of 784 persons that had smallpox between April 13 and August 31, 1924, as 163 years, 8 months and 17 days. No attempt was made to figure out the economic loss by assigning an arbitrary earning capacity value to this time lost, but it is obvious that the economic loss was stupendous.

"Cold-bloodedly considered, these unnecessary epidemics do not pay. They are a cruel waste of hard-earned money, both of individuals and of the state."

STATE NEWS ITEMS.

Dr. and Mrs. Albert McKenzie, who spent several weeks in Baltimore and Philadelphia, where they attended the Sesqui-Centennial Exposition, have returned to Jacksonville.

* * *

The Manatee County Medical Society entertained the Sarasota County Society at the Dixie Grand hotel, November 16th. After the banquet, Dr. Gideon Timberlake, formerly of Baltimore, but now of St. Petersburg, gave a talk on hematuria. Drs. Feaster and Griffin of St. Petersburg were also guests.

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Dr. and Mrs. Stephen Gyland of Tampa announce the birth of a son, November 18, 1926.

* * *

Dr. Alpheus K. Wilson of Jacksonville returned recently from a three-months stay in Vi-

enna, doing post-graduate work in eye, ear, nose and throat clinics.

* * *

Through the solicitation of Dr. Joseph Halton, Honore and Potter Palmer, of Chicago and Sarasota, have given to the Sarasota Hospital a complete X-ray department. This is one of the most completely equipped departments in the state.

* * *

Dr. and Mrs. E. L. Biggs of Starke left recently for a short visit in Havana, Cuba.

* * *

Dr. M. A. Lischkoff of Pensacola has been received as a fellow of the American College of Surgeons.

* * *

Dr. A. H. Freeman of Ocala has returned from a visit at Clayton, Ga.

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The Volusia County Medical Society held its regular monthly meeting November 9, 1926, 6:30 p. m., at Cattaneo's grill, Daytona Beach. Dinner was followed by an interesting scientific and business meeting. The subject of the evening was "Better Meetings." The secretary, Dr. R. L. Miller, reports that, with twenty-two members present, this proved to be a very fine get-together, but better ones are being planned for the future.

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Drs. Pennington and Pennington of Lake Wales have opened a private hospital at that place.

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The November meeting of the Lake County Medical Society was held at the Bietarm Hotel, Tavares, with nine members in attendance. Dr. J. S. McEwan of Orlando read a paper on "Chronic Gall-Bladder Diseases" which was discussed by Dr. S. H. Hodgson of Clermont.

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Drs. Jas. D. Love and R. H. McGinnis are now located at 1463 Oak street, Jacksonville, having removed from 501 Laura street on November 1.

* * *

Dr. J. M. Hoffman of Pensacola has been appointed acting secretary of the Escambia County Medical Society and will complete the term of the former secretary, Dr. Herbert Snyder, who has been forced to resign owing to serious illness in his immediate family. It is probable that at the time this issue of the Journal comes off the press, Escambia County will have reached the 100% paid list, inasmuch as but one member of that society was in arrears on December 1.

Dr. T. W. Causey's hospital at Lakeland was closed on November 10.

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The November meeting of the Broward County Medical Society was held on November 9. Dr. C. D. Hoy, chief of surgery, White Cross Hospital, Columbus, Ohio, spoke on the "Treatment of Fractures of the Ankle and Wrist." Dr. A. P. Harrison, acting health officer of Ft. Lauderdale, submitted to the society an outline for a city board of health which was unanimously approved.

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The Pensacola Hospital has been placed in the preferred classification by the standardization committee of the American College of Surgeons.

* * *

At the November meeting of the Orange County Medical Society, held at Sanford, November 17th, the members from Seminole County decided to break away from the Orange County Medical Society and form an organization of their own. With the assistance of Dr. Maurice E. Heck of DeLand, councilor for the Seventh District, a temporary organization was affected, and the following officers elected:

President—Dr. Sam Puleston, Sanford.
Vice-Pres.—Dr. J. W. Martin, Oveido.
Secy.-Treas.—Dr. Chas. Park, Sanford.

* * *

The Columbia County Medical Society held its regular meeting in the office of the Lake City Chamber of Commerce, November 1st, with Dr. J. H. Dyer of Lake City presiding. Dr. A. L. Blalock of Madison presented a paper. A lengthy discussion was held among the doctors.

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At the November meeting of the DeSoto-Hardee-Highlands County Medical Society, appendicitis and diphtheria were the topics of discussion. Dr. M. L. Crum of Arcadia and Dr. J. E. Garner of Wauchula led the discussions, after delivering two well-prepared papers.

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Dr. L. M. Anderson, councilor for the Third District; Dr. L. J. Arnold, secretary of the Columbia County Medical Society, together with the secretary-treasurer and business manager of the State Association, spent two days recently visiting physicians in Columbia, Madison, Hamilton and Suwannee Counties in the interest of the get-together meeting in Lake City, December 13th, for the formation of a multiple county society.

Dr. W. E. Van Landingham of West Palm Beach made a trip to Jacksonville recently to appear before the grand jury for the purpose of identifying certain papers in connection with the activities of the State Board of Medical Examiners in ridding the state of its "diploma mill" doctors.

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Dr. Eugene S. Gilmer and Dr. Robert P. Henderson announce they have become associated in the practice of urology, with offices at 613 Citizens Bank Building, Tampa.

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Dr. H. Mason Smith and Dr. Nathaniel L. Spengler announce the removal of their offices from 501 Stovall Building to 903 Tampa Theater Building, Tampa.

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The marriage of Mrs. Helen M. Willis and Dr. S. B. Forbes on November 6th will be of interest to their many friends.

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Dr. and Mrs. Forbes have returned from a motor trip through the mountains of North Carolina, stopping over in Atlanta and Athens, and are now at home at the Carlton Apartments in Tampa.

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Congratulations to Dade County Medical Society. According to the records, Dade County Medical Society is first in total membership as well as paid members.

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Dr. Clement Lanier Richardson of Jacksonville died December 3rd. He was eighty-five years of age and practiced his profession in Louisiana over fifty years. After retiring, several years ago, he came to Florida to reside with his son, Dr. Shaler Richardson. Dr. Richardson received his M.D. degree from the College of Physicians and Surgeons, Baltimore, and the M.A. degree from the University of North Carolina. He served in the Confederate army four years.

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Located in the central residential district of Atlanta, on street car line and 5 minutes from railway terminals.

Thirty rooms en suite or single with private lavatory, toilet, private bath.

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Every patient receives the maximum of individual attention.

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Rates and reservations furnished on application.

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W. A. GARDNER, M.D., Medical Director.

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Provides the comforts and luxuries of a resort hotel and the complete equipment of a modern hospital, including major and minor operating rooms; x-ray, clinical and metabolic laboratories; physiotherapy department, etc. SPECIAL DEPARTMENT OF DIETETICS.

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REASONABLE RATES. Every room in the Gorgas Hotel-Hospital has either a private or connecting bath, but the rates are reasonable—the same as in all first class hotels and hospitals. The ANNEX was recently opened. This building was formerly the Nurses Home and is connected by a closed corridor with the Gorgas Hotel-Hospital. It provides a number of ward rooms, in some of which the rate for board, nursing, and usual hospital attention is $3.00 a day. No charge is ever made for professional services rendered physicians and the dependent members of their families, and special rates are given them in the Gorgas Hotel-Hospital.

The Gorgas Hotel-Hospital is advertised only to the medical profession.

Physicians are cordially invited to visit the Clinic and the Gorgas Hospital at any time.

For further information address:

THE SEALE HARRIS CLINIC or GORGAS HOTEL-HOSPITAL

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